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# **Structural Solutions to Social Dilemmas: A Field Study on Commuters' Willingness to Fund Improvements in Public Transit<sup>1</sup>**

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The present field study examined commuters' ( $N = 152$ ) willingness to fund improvements in public transit. Consistent with Samuelson's (1993; Samuelson & Messick, 1995) multiattribute evaluation model of structural change in social dilemmas, support for the transit plan was higher when it was perceived to be (a) effective at reducing congestion and pollution, (b) personally beneficial, and (c) fair in terms of taxes and benefits. Also consistent with predictions, these relationships were moderated by individual differences in social value orientation (McClintock, 1978; Messick & McClintock, 1968) and the consideration of future consequences (CFC; Strathman, Gleicher, Boninger, & Edwards, 1994). Prosocials responded more to the perceived fairness of the plan, while proselves responded more to the plan's effectiveness in reducing congestion. Low CFCs responded more to the plan's personal benefits and effectiveness in reducing congestion, while high CFCs responded more to the plan's effectiveness in reducing pollution.

Seattle's traffic problem is among the worst in the United States. Between 1980 and 1990, commuting by car increased from 64% to 73%, and it is estimated that over the next 15 years, with no changes to the existing transit system, commuting speed will drop from 30 to 19 mph (48.0 to 30.4 km/hr; Shapley,

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1996). The increasing traffic problems have resulted in several proposals for increasing public transit. In March 1995, 53% of the Seattle region's voters rejected a 16-year, \$6.7 billion transit plan developed by the Regional Transit Authority (RTA; Schaefer, 1996). In November 1996, the RTA asked voters to support a scaled back, 10-year, \$3.9 billion plan that included commuter and light rail, as well as increases in bus service and carpool lanes. In contrast to the earlier vote, 58% of voters approved the new plan (Fleenor, 1996).

The challenge of raising support for improvements in public transit poses an important question; namely, when will commuters be willing to fund improvements in public transit? The present study attempts to shed light on that question by drawing on past theory and research in the area of *social dilemmas*, broadly defined as situations in which "the collective consequence of reasonable individual choices is disaster" (Messick & Brewer, 1983, p. 12). We assume that commuting decisions can be viewed as a form of social dilemma (cf. Van Lange, Van Vugt, Meertens, & Ruiters, 1998; Van Vugt, Van Lange, & Meertens, 1996; Van Vugt, Van Lange, Meertens, & Joireman, 1996) and that the transit plan proposed to Seattle area voters can be viewed as a potential "structural solution" to that dilemma.

Thus, our primary concern is to understand the conditions under which commuters are willing to financially support a structural solution to their primary dilemma, overreliance on cars. To address this question, we draw on Samuelson's (1993; Samuelson & Messick, 1995) multiattribute evaluation model of structural change in social dilemmas. Using this model, we assume that commuters' support for the transit plan will vary as a function of their evaluation of the plan along four dimensions (i.e., congestion reduction, pollution reduction, distributive fairness, and personal benefit), and that the importance of these four evaluative dimensions will vary as a function of individual differences in social value orientation (McClintock, 1978; Messick & McClintock, 1968), and the consideration of future consequences (CFC; Strathman, Gleicher, Boninger, & Edwards, 1994). These hypotheses, outlined in detail later, were tested by surveying Seattle area commuters shortly before the official vote on the proposed transit plan.

### Individual and Structural Solutions to Social Dilemmas

Social dilemmas, like the transportation problem in Seattle, represent a pervasive problem facing society (for an overview, see Komorita & Parks, 1994). As such, many studies have attempted to identify means of solving social dilemmas. Two approaches to solving social dilemmas have typically been delineated (Messick & Brewer, 1983). So-called *individual solutions* attempt to influence individual-level decision making, without necessarily altering the incentive structure of the original social dilemma (e.g., via appeals to conscience). So-called *structural solutions*, by contrast, represent collective action aimed at

altering the decision-making authority (e.g., by electing a leader) or altering the incentive structure of the decision (e.g., by making the cooperative response more attractive).

Of the two types of solutions, structural solutions are generally viewed as more promising. Nevertheless, successful implementation of structural solutions requires the support of decision makers. Accordingly, it becomes important to ask, How do individuals evaluate the attractiveness of a proposed structural solution to a challenging social dilemma? To address that question, we turn to Samuelson's (1993; Samuelson & Messick, 1995) multiattribute evaluation model of structural change in social dilemmas.

Structural solutions to social dilemmas (e.g., a new transit system) often involve transition costs from the certain status quo to the less certain "solution." Samuelson (1993; Samuelson & Messick, 1995) has argued that to compensate for these factors, decision makers must believe that the solution will afford sufficient benefits along several dimensions, including efficiency, self-interest, fairness, and freedom. Samuelson's model further assumes that the importance of such dimensions will vary, in theoretically meaningful ways, between people. In short, Samuelson argues for an interactionist approach to the evaluation of structural solutions to social dilemmas.

Samuelson's model has received some initial support in both the laboratory (Samuelson, 1993) and the field (Van Vugt, 1997). For example, Van Vugt surveyed British train commuters regarding their support for privatizing the British Rail system. Van Vugt found that commuters' support for such a move was negatively related to the plan's perceived transition costs, and positively related to its perceived personal and collective benefits. Theorizing that support for privatization may relate to person variables shown to influence decision making in social dilemmas, Van Vugt further assessed individual differences in social value orientation (Messick & McClintock, 1968), distinguishing between those who maximize their own gain (proselfs) and those who maximize collective gain (prosocials). Consistent with the interactionist framework advocated by Samuelson, Van Vugt found that the relative importance of both transition costs and personal benefits varied as a function of the individual's social value orientation. When evaluating the proposed privatization plan, proselfs placed more weight on personal concerns, while prosocials placed more weight on the plan's transition costs.

The present study extends Van Vugt's (1997) work in several ways. First, we focus on a different real-world structural solution; namely, a transit plan that would result in additional carpool priority lanes, as well as additional public transit. Second, we focus on a structural solution that voters are themselves responsible for funding (i.e., via increased taxes). Third, we explore how both social value orientation and the CFC (Strathman et al., 1994) differentially moderate the relationship between four evaluative dimensions (personal benefit, congestion reduction, pollution reduction, and distributive fairness) and support for the plan.

Based on past theory and research, it seems reasonable to expect that before spending \$3.9 billion over a 10-year period, individuals must be convinced that the new transit system affords certain benefits. Thus, we would predict that individuals should express stronger support for the transit plan to the extent that they believe it will be effective at reducing congestion (Hypothesis 1), that it will be personally beneficial (Hypothesis 2), that it will reduce pollution (Hypothesis 3), and that it will fairly distribute costs (taxes) and benefits (Hypothesis 4). It is important to note that such benefits differ both in terms of their impact on personal and social outcomes, as well the extent to which such benefits will be more immediate or more delayed in their realization. Thus, while these hypotheses seem reasonable, empirical and theoretical considerations suggest that individuals will be differentially sensitive to these four dimensions on the basis of the importance that they attach to collective outcomes (i.e., social value orientation), as well as the extent to which they consider the future consequences of their actions (i.e., CFC).

#### Social Value Orientation and Consideration of Future Consequences (CFC): Social and Temporal Transformations

*Social value orientation* refers to the weight that an individual assigns to his or her own and another's well-being in socially interdependent settings (McClintock, 1978). Many studies indicate that individuals with a *prosocial* orientation (those concerned with maximizing joint gain or minimizing the difference in self-other outcomes; cf. Van Lange, 1999) exercise greater restraint and evidence more cooperation than do *individualists* (those concerned with maximizing their own outcomes) or *competitors* (those concerned with maximizing their relative advantage over others; e.g., Kramer, McClintock, & Messick, 1986; Kuhlman & Marshello, 1975; Liebrand, Wilke, Vogel, & Wolters, 1986; Roch & Samuelson, 1997). Because the measurement of social value orientation has been designed to reduce strategic considerations (i.e., people choose between options that provide points to the self and others, without feedback), prosocials' higher level of cooperation is commonly viewed as reflecting an equally positive concern with own and others' well-being, rather than a form of enlightened self-interest (e.g., Batson, 1994).

By contrast, Strathman et al. (1994) have identified a personality construct that more closely reflects this notion of enlightened self-interest. Strathman et al.'s construct, the CFC, reflects the weight that an individual assigns to the immediate versus distant consequences of his or her behavior. Individuals scoring high on the consideration of future consequences are more likely to solve individual dilemmas by assigning greater weight to future consequences of their actions (e.g., engaging in personally beneficial health behaviors). Because Strathman et al.'s scale does not explicitly reference others' outcomes, it seems reasonable to assume that consideration of future consequences predicts

collectively beneficial behavior primarily out of a concern for the long-term personal consequences of one's own behavior. Given their theoretically distinct dimensions, it seems reasonable to expect that social value orientation and CFC will moderate the relationship between the four evaluative dimensions (congestion reduction, pollution reduction, fairness, and personal benefit) and support for the proposed transit plan in different ways.

### Social Value Orientation and Support for the Transit Plan

As noted previously, social value orientation reflects an individual's concern with his or her own and others' outcomes in interdependent settings. How might social value orientation relate to support for the new transit plan? First, we would assume that congestion reduction is primarily a personal concern and, as such, should be more important to those with a proself orientation. Indeed, prior work has demonstrated that proselfs' commuting preferences are more responsive to the possibility of congestion (Van Lange et al., 1998; Van Vugt, Meertens, & Van Lange, 1995). As such, we would predict a two-way interaction between social value orientation and perceived congestion reduction such that, relative to prosocials, proselfs' support for the proposed transit plan should be more closely related to the perceived effectiveness of the solution at reducing congestion (Hypothesis 1a).

Second, recent work by Van Vugt (1997) suggests that proselfs will also be more sensitive to the personal benefits afforded by the proposed transit plan. Hence, we would predict a two-way interaction between social value orientation and the perceived personal benefits of the plan (Hypothesis 2a). Third, it seems reasonable to assume that because pollution has implications for both oneself and others, prosocials will be more responsive than will proselfs to the perceived effectiveness of the proposed transit plan at reducing pollution (cf. Van Vugt et al., 1995). Thus, we would predict a two-way interaction between social value orientation and perceived effectiveness at reducing pollution (Hypothesis 3a).

Finally, social value orientation is highly relevant to the issue of fairness (cf. Van Lange, 1999). Indeed, Samuelson (1993) has shown that, relative to proselfs, prosocials report fairness to be a more important consideration in their evaluation of various structural solutions. Thus, we would predict a two-way interaction between social value orientation and the perceived fairness of the plan such that, relative to proselfs, prosocials should be more sensitive to the perceived fairness of the plan (Hypothesis 4a).

### CFC and Support for the Transit Plan

As noted earlier, the CFC reflects the extent to which individuals consider the immediate versus distant consequences of their behavior. Falling into the

category of immediate concerns are the evaluative dimensions of congestion reduction and personal benefit, as these would likely be the earliest benefits of the proposed transit plan. Thus, in terms of their support for the proposed transit plan, it seems reasonable to assume that those low in CFC will be more responsive to the perceived effectiveness of the proposed transit plan in reducing congestion and the perceived personal benefits afforded by the plan. By contrast, those high in consideration of future consequences should be more responsive to the perceived effectiveness of the proposed plan at reducing pollution, as a concern with pollution is more characteristic of a concern with the distal consequences of one's own behavior. To restate, using support for the transit plan as the dependent measure, we predict three 2-way interactions: the first between consideration of future consequences and perceived effectiveness at reducing congestion (Hypothesis 1b), the second between CFC and perceived personal benefit afforded by the plan (Hypothesis 2b), and the third between consideration of future consequences and perceived pollution reduction (Hypothesis 3b). Given that fairness is fundamentally defined in terms of a distribution of outcomes (plan benefits, generally defined) to inputs (the tax increase) across self and others, individuals are not expected to be differentially sensitive to the perceived fairness of the plan on the basis of their standing on the CFC.

To test these hypotheses, a field study was conducted in which commuters were asked to evaluate a recent ballot measure that would devote \$3.9 billion over a 10-year period toward improving public transportation in the Puget Sound region. Our primary dependent measure was support for the transit plan, rather than actual voting behavior. Nevertheless, as noted later, intended voting behavior was strongly correlated with support for the transit plan.

## Method

### *Participants and Procedure*

Participants consisted of daily commuters in the Seattle area. Surveys were distributed during morning and afternoon rush hours at a central connecting point for regional buses and at several gas stations in all counties eligible to vote on the proposed transit plan. Potential participants were asked if they were commuters and, if so, whether they would be willing to complete a short survey on commuting decisions. Those who agreed received a survey with return postage, which they could later complete at home or at work in approximately 20 min. Participants who indicated interest received a short summary of the study's results.

Of the 600 surveys that were handed out, 189 (31.5%) were returned, resulting in a sample of 82 men, 104 women, and 3 gender-unidentified, with a mean age of 37 years, 9 months. While a response rate in this range is not unheard of (e.g., Davila, Bradbury, Cohan, & Tochluk, 1997; Joireman, Van Lange,

Kuhlman, Van Vugt, & Shelley, 1997; Morokoff et al., 1997), it was lower than we had hoped. A number of factors may account for the low return rate. First, we attempted to hand out the survey as close to the election as possible (no earlier than 2 weeks before the election), and we requested that the surveys be returned before the election took place. Thus, there was a relatively short window of time for potential participants to complete the survey. In addition, incentives for participation were unavailable. Other research using a similar mailback survey suggests that the presence of an incentive may have resulted in a larger response rate (e.g., Van Vugt et al., 1995; Van Vugt, Van Lange, & Meertens, 1996).

### *Personality Measures*

*Social value orientation.* Participants' social value orientation was assessed using a set of nine 3-alternative decomposed games (Messick & McClintock, 1968), adapted from Van Lange and Kuhlman (1994). Past research supports both the internal reliability (Liebrand & Van Run, 1985) and the temporal stability of the decomposed-games measure (Kuhlman, Camac, & Cunha, 1986). Further work suggests that this measure is free from concerns with social desirability (Platow, 1995); and an increasing number of studies support the ecological validity of the social value orientation construct, for example, in such areas as helping behavior (McClintock & Allison, 1989), negotiation (De Dreu & Van Lange, 1995), and sacrifice in interpersonal relationships (Van Lange, Agnew, Harinck, & Steemers, 1997).

A complete description of the decomposed-game procedure used here can be found in Van Lange, Otten, De Bruin, and Joireman (1997). As an example, in the first game, participants chose among three options offering points to self and other (A = 480 Self, 80 Other; B = 540 Self, 280 Other; C = 480 Self, 480 Other). In this game, a competitor would choose A (highest relative gain), an individualist would choose B (highest own gain), and a prosocial would choose C (highest joint gain, smallest difference). In the present study, to be classified, a participant had to demonstrate a consistent preference for one of the three orientations in at least six of the nine games. On this basis, 152 of the 189 participants (80.4%) were classifiable, including 110 prosocials (53 men, 56 women, 1 gender-unidentified), 35 individualists (13 men, 22 women), and 7 competitors (6 men, 1 woman). Given that individualists and competitors demonstrate a number of behavioral and cognitive similarities in simulations of commuters' dilemmas (Van Vugt et al., 1995) and because differences between individualists and competitors were not of theoretical interest, we classified participants into one of two orientations, including *prosocials* (cooperators or altruists) and *proselfs* (individualists and competitors), a common convention in the field (cf. Kramer et al., 1986; Roch & Samuelson, 1997; Van Lange & Liebrand, 1991; Van Vugt et al., 1995).



*CFC.* The CFC was measured using Strathman et al.'s (1994) 12-item scale ( $\alpha = .81$ ), which includes such items as "I consider how things might be in the future and try to influence those things with my day-to-day behavior," and "I generally ignore warnings about possible future problems because I think the problems will be resolved before they reach crisis level." Participants indicated the extent to which such statements were characteristic of themselves on a scale from 1 (*extremely uncharacteristic*) to 5 (*extremely characteristic*). Strathman et al. have shown that, in addition to possessing high internal and test-retest reliability, the CFC scale exhibits good convergent and discriminant validity.

#### *Proposed Transit Plan Questionnaire*

*Description of the transit plan.* Participants read the following description of the proposed transportation initiative:

On November 5 of this year, voters will be asked to decide on the Regional Transit Authority's (RTA) Sound Move Initiative. This initiative is a 10-year, \$3.9 billion plan to fund increases in public transportation (i.e., additional rapid regional bus routes, commuter rail on existing rail lines, and high capacity light rail), as well as high occupancy vehicle (HOV) lanes. Funding for the initiative would be generated from an increase in both the sales tax (0.4%) and vehicle licensing tax (0.3%).

*Support for the transit plan.* Participants rated their overall evaluation of the plan (our primary dependent measure) on a 7-point scale ranging from 1 (*strongly opposed*) to 7 (*strongly in favor*) and indicated, "If the election were held today," whether they would vote for or against the plan. Support for the plan and intended vote on the plan were strongly correlated ( $r = .86, p < .001$ ).

*Evaluative judgments.* Subsequently, participants rated the extent to which they believed that they would use the new transportation system (if built) for work, errands, and social/community activities on a 4-point scale ranging from 1 (*never*) to 4 (*frequently*), and the extent to which they thought that the new system would improve their commute, their errand running, and their attending social/community activities, also on a 4-point scale ranging from 1 (*not at all*) to 4 (*a lot*). These six items were averaged into a personal benefit variable ( $\alpha = .82$ ).

In addition, participants indicated how effective they thought that the plan would be in reducing congestion and pollution on a 7-point scale ranging from 1 (*highly ineffective*) to 7 (*highly effective*), and how fair the plan was in terms of taxes and benefits, also on a 7-point scale ranging from 1 (*very unfair*) to 7 (*very fair*). While it might be argued that congestion reduction should be included in

the general personal benefit variable, we have chosen to keep it separate for theoretical reasons. Specifically, predictions regarding social value orientation were based, in large part, on past work suggesting that commuting decisions may be framed as either an environmental problem, or as an accessibility problem, depending on the individual's social value orientation (Van Lange et al., 1998; Van Vugt et al., 1995). As such, maintaining a theoretical distinction between congestion reduction (a specific benefit) and overall personal benefit (a more general benefit) appeared warranted.

## Results

### *Preliminary Analyses*

In developing our hypotheses, we assumed that social value orientation and the CFC are theoretically distinct constructs. In general agreement with this reasoning, prosocials exhibited nearly identical levels of CFC ( $M = 3.89$ ,  $SD = 0.52$ ), relative to proselves ( $M = 3.88$ ,  $SD = 0.54$ ),  $t(149) < 1$ , *ns*.

Further analyses on the primary variables (transit plan, pollution, congestion, fairness, personal benefit, CFC, and social value orientation) revealed no gender differences, no commuter type (car, bus, car/bus, carpool) differences, and only one significant main effect of county on perceived effectiveness of the plan at reducing pollution. Given these results, and given that these variables did not constitute our primary interest, participants' gender, commuter status, and county of residence were not included as variables in our analyses.

### *Simple Correlations With Support for the Transit Plan*

As a first step in our analyses concerning the transit plan, we computed simple correlations between support for the plan, the four evaluative judgments, and the two personality measures, as shown in Table 1. Because of missing data, only 141 cases were available for analysis. As predicted, support for the plan was higher when participants believed that the plan would effectively reduce congestion ( $r = .63$ ) and pollution ( $r = .59$ ), when participants believed that they would personally benefit from the plan ( $r = .55$ ), and when the plan was perceived as fair ( $r = .74$ ). Also noteworthy is the fact that social value orientation and consideration of future consequences were not significantly related to support for the plan ( $r = .11$  and  $.13$ , respectively). CFC did, however, show moderate positive relationships with the perceived fairness of the plan ( $r = .18$ ), its effectiveness in reducing pollution ( $r = .15$ ), and the perceived personal benefit of the plan ( $r = .27$ ). Finally, Table 1 reveals that the four evaluative judgments are intercorrelated, which may be a result of the fact that (a) each of these judgments has a good versus bad meaning, and (b) different "events" tend to co-occur in the real-

Table 1

*Correlations Between Support for the Transit Plan, Evaluative Judgments, and Personality Variables*

	<i>M</i>	<i>SD</i>	Plan	CR	PB	PR	F	SVO
Support for transit plan (plan)	5.32	1.89	—					
Congestion reduction (CR)	4.96	1.52	.63**	—				
Personal benefit (PB)	2.24	0.71	.55**	.45**	—			
Pollution reduction (PR)	5.01	1.33	.59**	.83**	.42**	—		
Fairness (F)	4.47	1.71	.74**	.53**	.41**	.54**	—	
Social value orientation (SVO)	1.26	0.44	.11	.07	.12	.05	.08	—
Consideration of future consequences (CFC)	3.87	0.54	.13	.05	.27**	.15	.18*	.02

*Note.*  $N = 141$  (with listwise deletion of data). Higher values indicate stronger support for the transit plan, higher perceived effectiveness of the plan at reducing congestion and pollution, higher perceived fairness of the plan, higher perceived personal benefit derived from the plan, a more prosocial orientation (SVO; 1 = prosocials, -1 = proselves), and greater CFC.

\* $p < .05$ . \*\* $p < .01$ , two-tailed.

life dilemma (e.g., congestion and pollution). Nevertheless, these constructs are theoretically distinct, and appear to be sufficiently distinct from an empirical point of view (i.e., generally sharing less than 30% of the variance, except for the link between judgments of congestion and pollution reduction).

#### *Regression Analyses Testing Hypotheses*

To test our hypotheses, we regressed, in a series of two steps, support for the transit plan on: (a) the two personality measures (social value orientation and CFC) and the four evaluative judgments (congestion reduction, personal benefit, pollution reduction, and fairness), and (b) the eight 2-way interactions between the two personality measures and the four evaluative judgments. Prior to

Table 2

*Hierarchical Regression Analyses Predicting Support for the Transit Plan*

		Predictor variables		Overall model		
		$\beta$	$t$	$R^2$	$F$	$df$
Step 1				.67	45.18**	6, 134
	CFC	-0.04	-0.73			
	SVO	0.02	0.50			
1	Congestion	0.23	2.45*			
2	Personal benefit (PB)	0.23	3.87**			
3	Pollution	0.03	0.32			
4	Fairness	0.52	8.40**			
Step 2				.72	22.89**	14, 126
	CFC	0.00	0.27			
	SVO	0.04	0.80			
1	Congestion	0.31	2.97**			
2	PB	0.29	4.10**			
3	Pollution	-0.02	-0.20			
4	Fairness	0.46	6.77**			
1a	SVO $\times$ Congestion	-0.19	-1.85†			
2a	SVO $\times$ PB	-0.07	-1.01			
3a	SVO $\times$ Pollution	0.09	0.94			
4a	SVO $\times$ Fairness	0.18	2.72**			
1b	CFC $\times$ Congestion	-0.25	-2.16*			
2b	CFC $\times$ PB	-0.14	-1.93†			
3b	CFC $\times$ Pollution	0.28	2.23*			
	CFC $\times$ Fairness	0.03	0.52			
Change				.05	2.71**	8, 126

*Note.* Hypotheses appear to the left of the relevant predictor term. CFC = consideration of future consequences, SVO = social value orientation (1 = prosocial, -1 = proself).

† $p < .10$ . \* $p < .05$ . \*\* $p < .01$ .

analysis, social value orientation was contrast coded (1 = *prosocial*, -1 = *proself*), while all remaining variables were centered around their mean (cf. Judd & McClelland, 1989). Table 2 displays the results of these analyses.

As shown at the top of Table 2, in support of Hypotheses 1, 2, and 4, participants' support for the plan was positively related to their perception that the plan would be personally beneficial ( $\beta = 0.23, p < .001$ ), would reduce congestion ( $\beta = 0.23, p < .02$ ), and was fair in terms of taxes and benefits ( $\beta = 0.52, p < .001$ ). Despite its significant correlation with support for the plan ( $r = .59$ ), pollution reduction was not significantly related to support for the plan, once the remaining variables had been taken into account. In addition, neither social value orientation nor CFC alone reliably predicted support for the plan.

While the preceding effects were in general support of our first set of hypotheses, our primary interest was to determine how social value orientation and consideration of future consequences would moderate the relationship between the four evaluative judgments and support for the plan. An inspection of the interaction terms, entered on the second step, revealed some support for our hypotheses, as shown at the bottom of Table 2.

*Social value orientation.* With respect to social value orientation, the results revealed two interactions. First, consistent with Hypothesis 1a, the marginally significant Social Value Orientation  $\times$  Congestion interaction ( $\beta = -0.19, p < .07$ ) indicated that the relationship between perceived effectiveness at reducing congestion and support for the plan was stronger for *proselfs* than for *prosocials*. Separate slopes for each group were tested for departure from zero following procedures outlined by Judd and McClelland (1989). Congruent with Hypothesis 1a, the results revealed a significant relationship between congestion reduction and support for the transit plan for *proselfs* ( $\beta = 0.50, p < .006$ ), but not for *prosocials* ( $\beta = 0.12, p = .29$ ). Second, results also revealed a significant interaction between social value orientation and the perceived fairness of the plan ( $\beta = 0.18, p < .008$ ). Consistent with Hypothesis 4a, the relationship between perceived fairness in terms of taxes and benefits and support for the plan was significantly stronger for *prosocials* ( $\beta = 0.65, p < .0001$ ) than for *proselfs* ( $\beta = 0.28, p < .02$ ). Contrary to our predictions, social value orientation failed to moderate the relationships between support for the transit plan and personal benefit and perceived pollution reduction, respectively.

*CFC.* Turning to the CFC, the results revealed one marginally significant and two significant interactions. First, consistent with Hypothesis 1b, the results revealed a significant CFC  $\times$  Congestion interaction ( $\beta = -0.25, p < .04$ ). To examine this interaction, separate slopes assessing the congestion-reduction-transit-plan relationship were tested for departure from zero for individuals 1 standard deviation above (high CFC = 4.41) and 1 standard deviation below the mean (low CFC = 3.33; cf. Judd & McClelland, 1989). Results revealed that the relationship between perceived congestion reduction and support for the plan was

stronger for those scoring low on the CFC scale ( $\beta = 0.55, p < .001$ ) than for those scoring high on the scale ( $\beta = 0.06, p = .66$ ). Second, in general agreement with Hypothesis 2b, a marginally significant CFC  $\times$  Personal Benefit interaction ( $\beta = -0.14, p < .06$ ) revealed a stronger positive relationship between perceived personal benefit and support for the plan for those scoring low on the CFC scale ( $\beta = 0.43, p < .001$ ) than for those scoring high on the scale ( $\beta = 0.15, p < .09$ ). Third, consistent with Hypothesis 3b, the significant CFC  $\times$  Pollution interaction term ( $\beta = 0.28, p < .03$ ) revealed a stronger positive relationship between perceived pollution reduction and support for the plan for those scoring high on the CFC scale ( $\beta = 0.23, p < .09$ ), relative to those scoring low on the scale ( $\beta = -0.27, p < .10$ ).<sup>3</sup>

### Discussion

The present field study examined commuters' support for a structural solution to a social dilemma that potentially challenges the well-being of individuals living in Seattle: overreliance on cars. Drawing on Samuelson's (1993; Samuelson & Messick, 1995) multiattribute evaluation model of structural change in social dilemmas, we predicted links between four evaluative dimensions (congestion reduction, personal benefit, pollution reduction, and fairness) and support for a proposed transit plan. In addition, we predicted that such links would be moderated by the relative importance that individuals assign to social outcomes and outcomes that are delayed (i.e., social value orientation and CFC, respectively).

Consistent with Hypotheses 1, 2, and 4, support for the transit plan was positively related to commuters' perception that it would reduce congestion, would be personally beneficial, and was fair in terms of taxes and benefits. More important, these relationships were moderated by the two personality variables in theoretically meaningful ways. Social value orientation (Messick & McClintock,

<sup>3</sup>We also explored whether social value orientation and CFC would predict knowledge of the transit plan (1 = *nothing* to 4 = *a lot*) and intention to vote on the plan (1 = *yes*, 0 = *no*), assuming that the decision to gather information relevant to voting and to vote (regardless of the direction of the vote) may reflect social dilemmas (Colman, 1995). A multiple regression analysis revealed that knowledge of the transit plan was positively associated with the CFC ( $\beta = 0.24, p < .01$ ), but was unrelated to social value orientation ( $p = .60$ ), adjusted  $R^2 = .04$ ,  $F(2, 147) = 4.47, p < .05$ . A logistic regression revealed that intention to vote was positively associated with CFC ( $B = 1.23$ , Wald = 7.50,  $p < .01$ ) and marginally associated with social value orientation ( $B = -1.52$ , Wald = 3.69,  $p = .06$ ). Interestingly, proselves expressed a stronger intention to vote, relative to prosocials.

While we consider these results informative, we did not use knowledge of the transit plan to predict support for the plan for two reasons. First, knowledge of the transit plan is ambiguous in an evaluative sense, as it fails to reveal the degree to which respondents supported the plan. Second, we had no reason, on the basis of Samuelson's (1993) model, to make predictions concerning knowledge of the plan.

1968) moderated two relationships: As predicted, proselves were somewhat more sensitive to their perception that the plan would be effective at reducing congestion, whereas prosocials were more sensitive to their belief that the plan was fair (Hypotheses 1a and 4a, respectively). Contrary to our predictions, social value orientation failed to moderate the personal benefit and pollution relationships, respectively. CFC (Strathman et al., 1994) moderated three relationships: as predicted, individuals concerned with the immediate consequences of their actions were more affected by their perception that the plan would reduce congestion (Hypothesis 1b) and would be personally beneficial (Hypothesis 2b), although the latter interaction was marginally significant. In addition, individuals concerned with the future consequences of their actions were more sensitive to their belief that the plan would be effective at reducing pollution (Hypothesis 3b). As discussed later, while limited in certain respects, the present study helps to extend past work on structural solutions to social dilemmas, social value orientation, and the CFC, and may hold several potentially important practical and theoretical implications that deserve further attention.

#### *Structural Solutions to Social Dilemmas and the Multiattribute Evaluation Model*

The present study extends past research on structural solutions to social dilemmas in at least three ways. First, the current study presents one of the first applications of Samuelson's (1993; Samuelson & Messick, 1995) multiattribute evaluation model of structural change in a field setting (cf. Van Vugt, 1997). Adapting this model to the transportation problem, we posited four evaluative dimensions corresponding to three of the model's original dimensions: *self-interest* was conceptualized in terms of the personal benefit afforded by the transit plan (i.e., the extent to which people would use the plan); *efficiency* was conceptualized in terms of the plan's ability to reduce congestion and pollution, respectively; and *fairness* was conceptualized in terms of the plan's ability to fairly distribute outcomes (i.e., new transit resources) in proportion to inputs (i.e., taxes required by the plan).

The results generally upheld the importance of each dimension. However, at the global level, one form of efficiency (i.e., pollution reduction) appeared irrelevant once the remaining three evaluative dimensions had been taken into account. One possible explanation for this result is that certain evaluative dimensions may overlap to such an extent that one implies another. For example, congestion reduction may result in pollution reduction, so that the latter is no longer important, once the former has been taken into account. A re-examination of the correlations in Table 1 reveals some support for this idea, as congestion reduction and pollution reduction were the most highly correlated evaluative dimensions ( $r = .83$ ). Assuming that this is the case, future applications of the multiattribute

evaluation model might benefit by more directly examining decision makers' perceptions that the various evaluative dimensions are related, and how such perceived interrelationships may impact support for structural solutions.

Second, the present study helps to extend past research on structural solutions to social dilemmas by focusing on a rather unique structural solution: a taxpayer-funded transit plan. To date, most past research on structural solutions to social dilemmas has focused on decision makers' willingness to vote for a leader to responsibly manage a common resource (e.g., Messick et al., 1983; Rutte & Wilke, 1984; Samuelson, 1991; Samuelson & Messick, 1986a, 1986b; Samuelson, Messick, Rutte, & Wilke, 1984). While voting for a leader is a viable solution to certain social dilemmas, it seems reasonable to assume the existence of a much broader range of possible solutions to the variety of social dilemmas that face society. The present study helps to highlight one of those solutions, a solution that may become increasingly prevalent as people attempt to grapple with the world's increasing traffic problems. A comparison of the present solution with the more traditional leader-based solution reveals some potentially interesting differences, as well as some arguably important similarities.

At least two features of the present solution distinguish it from the more traditional leader-based solution. First, whereas leader-based solutions attempt to encourage cooperation by limiting decision makers' freedom to choose, the present solution attempts to enhance cooperation by increasing the incentives associated with the cooperative alternative (i.e., increasing access to public transit), while maintaining decision makers' freedom to choose whether or not to utilize that solution. All other things being equal, such freedom-preserving solutions are more likely to receive support than are freedom-restricting solutions, like voting for a leader (cf. Rutte & Wilke, 1985; Samuelson, 1993; Samuelson & Messick, 1995; Van Vugt & De Cramer, 1999).

Second, whereas traditional leader-based solutions do not typically require a contribution, the present solution required the financial support of voters. With few exceptions, structural solutions that are funded by decision makers have received little attention (cf. McCusker & Carnevale, 1995; Yamagishi, 1986). Although the present data do not allow us to test this possibility, we believe that structural solutions that are directly funded by decision makers may receive less support than those solutions that, while possibly costly in the long run, are not directly funded. While nonfunded structural solutions, like voting for a leader, may ultimately imply a loss of individual resources (e.g., in terms of reduced access to a common resource), decision makers may feel that directly funding a structural solution requires more sacrifice.

While admittedly speculative, the distinction between funded and nonfunded (but eventually costly) solutions may parallel the classic distinction between give-some and take-some dilemmas, respectively (Messick & Brewer, 1983). A growing body of evidence suggests that while such dilemmas can be made



mathematically equivalent, they may be very different psychologically, with give-some dilemmas producing less cooperation (e.g., Brewer & Kramer, 1986; McCusker & Carnevale, 1995). By this reasoning, directly funded (give-some) structural solutions may receive less support than nonfunded, but eventually costly (take-some) solutions. We do not mean to imply that the present structural solution would have produced less support than would a leader-based solution. Indeed, it is difficult to imagine electing a leader to make commuting decisions for a community. Rather, we wish to highlight a more general problem, the potentially important difference between solutions that are directly versus indirectly funded.

Future research might attempt to extend the multiattribute evaluation model by incorporating the framing of structural solutions as an additional dimension. Despite the preceding differences, Samuelson's (1993) model fared well when applied to the current structural solution, suggesting that while various structural solutions may result in different levels of support, support for a variety of different solutions may be effectively modeled using the multiattribute evaluation model.

Third, by focusing on both social value orientation and the CFC, the present study extends past research on structural solutions to social dilemmas, which has tended to focus solely on social value orientation. The applied nature of the present study also helps to complement and extend past research on the ecological validity of these two constructs.

### *Individual Differences in the Evaluation of Structural Solutions*

*Social value orientation.* Since its introduction over 30 years ago (Messick & McClintock, 1968), social value orientation has received a great deal of attention in the social-dilemma literature. Based on past theory and research, we predicted that social value orientation would moderate the relationship between support for the transit plan and each of the four evaluative dimensions (personal benefit, congestion reduction, pollution reduction, and fairness).

Consistent with two of our predictions, individuals were differentially sensitive to the perceived fairness of the plan, as well as its effectiveness at reducing congestion on the basis of their social value orientation, thus supporting previous empirical work (e.g., Samuelson, 1993; Van Vugt et al., 1995). Inconsistent with our predictions, prosocials and proselves were equally sensitive to the personal benefit derived from the plan. While contrary to our hypothesis, these results appear to be consistent with previous findings that prosocials and proselves report an equal concern with individual travel attributes (e.g., Van Vugt et al., 1995; Van Vugt, Van Lange, & Meertens, 1996). Moreover, such results are consistent with the definition and measurement of social value orientation, which ultimately distinguishes between prosocials and proselves, not on the basis of concern with self,

but rather on the basis of concern with other (cf. Korsgaard, Meglino, & Lester, 1996).

Another interesting finding that failed to support our hypothesis is that prosocials and proselves did not differ in their responsiveness to the plan's ability to reduce pollution. Why might this be? One possible explanation is that while prosocials are, by definition, more concerned than are proselves with others' well-being, it may be that a concern with pollution requires an individual to first "travel down the road of delayed consequences" before concern with others is even relevant. Even then, one's perceived impact on others is likely to be minimal in situations like the present one (i.e., transportation decisions). One global implication of this argument is that social value orientation may better predict decisions that readily bring to mind the interdependence of outcomes. That congestion involves an immediate face-to-face encounter, and fairness implies a comparison of the distribution of costs and benefits over self and others, may explain why proselves and prosocials were especially sensitive to these dimensions, respectively.

*CFC.* Compared to social value orientation, CFC has received little, if any, attention within the social dilemma literature (cf. Insko et al., 1998; Mannix, 1991; Messick & McClelland, 1983). The present findings suggest that CFC should receive more attention in the social dilemma literature. Our results reveal that individuals concerned with the immediate consequences of their behavior were more sensitive to their perception that the transit plan would be personally beneficial and would reduce congestion (i.e., more immediate benefits of the plan). By contrast, individuals concerned with the future consequences of their actions tended to be more sensitive to the perception that the plan would reduce pollution (i.e., a more distal benefit of the plan). While in line with our hypotheses, the latter result is open to at least two different interpretations. One possibility is that individuals high in CFC found it in their own best interest to support a solution that would reduce pollution. On the other hand, these same individuals may have been sensitive to the social benefits associated with reduced pollution. Our initial reasoning led us to assume the former. Nevertheless, the present results do not allow for a clear choice between these alternative interpretations.

The finding that social value orientation was unrelated to CFC in the present study would seem to support the claim that the CFC scale is not assessing a concern with social well-being, but rather what Batson (1994) has referred to as enlightened self-interest. However, early theory and research on social value orientation suggests that a prosocial orientation might develop out of a concern with one's own long-term well-being (e.g., Kelley & Grzelak, 1972; McClintock, 1978), and at least two past studies have demonstrated links between CFC and proenvironmental behavior; behavior that is arguably in the common interest (Lindsay & Strathman, 1997; Strathman et al., 1994). In addition, one recent

study has revealed a positive relationship between a prosocial orientation and CFC (Joireman, Lasane, Bennett, Richards, & Solaimani, in press), and has shown that those high in CFC express a stronger intention to engage in proenvironmental political behavior when they believe that the state of the environment has social consequences. Thus, it is apparent that more research is needed to determine the extent to which social value orientation and CFC represent similar or distinct constructs. Given that many social dilemmas contain both a social dimension (i.e., individual vs. collective interests) and a temporal dimension (i.e., immediate vs. delayed interests), such research would be especially helpful in informing our understanding of how individuals make decisions in social dilemmas.

Taken together, the preceding results provide support for the argument that personality may play an important role in an individual's evaluation of structural solutions to social dilemmas (cf. Samuelson, 1993; Samuelson & Messick, 1995). Given the promise of this interactionist approach, further research in this area appears warranted. In attempting to anticipate the extent to which such results will generalize to other settings, it seems reasonable to assume that social value orientation and CFC, and other potentially relevant personality constructs, will likely be more important in situations that are in some sense ambiguous (cf. Snyder & Ickes, 1985). The present situation would appear to fall into the situationally weak category, as only 58% of the voters approved the plan, an outcome that suggests the absence of a powerful social norm favoring either perspective on the transit plan.

### *Potential Limitations and Implications*

In closing, we wish to discuss several limitations and possible implications of the current study. Beyond the relatively low response rate, it is worth noting that we surveyed only commuters when, in fact, noncommuters also voted on the transit plan. While this strategy limits the generalizability of our findings, the use of commuters faced with a real decision regarding a potential structural solution with relevance to their daily lives would seem to represent a move in the direction of generalizing lab-based findings to the real world. On a related note, given that we focused on a single structural solution, it is possible that some of the findings may be affected by certain time- or location-specific variables. At the same time, we believe that similar types of structural solutions are not uncommon in the real world.

Finally, it seems important to recognize that support for the implementation of a structural solution may not directly translate into (a) actual voting behavior, or (b) utilization of the solution. With regard to the former, while we did not assess actual voting behavior, intention to vote for or against the plan was strongly correlated with support for the plan ( $r = .86, p < .001$ ). With regard to

the latter, it is indeed important to note that the implementation of a structural change does not guarantee that it will be viewed as a solution (e.g., Van Vugt, Van Lange, Meertens, & Joireman, 1996). This suggests that understanding the factors that lead people to support the implementation of a structural solution is only the first of several steps in understanding what ultimately leads to successful structural interventions.

Despite the preceding caveats, we believe that the present study has a number of potentially important theoretical and practical implications. Practically speaking, the present results suggest that structural solutions are more likely to be supported to the extent that they are perceived as effective, personally beneficial, and fair. A comparison of the outcomes of the two transit plans recently proposed to Seattle voters suggests the importance of another important factor, transition costs (cf. Van Vugt, 1997). As noted earlier, the present transit plan, which was ultimately approved by voters, represented a significantly reduced version of an earlier plan costing \$6.4 billion, which was rejected by voters. Thus, although not directly tested in the present study, the importance of transition costs should not be underestimated. Such costs, which may come in the form of increased taxes and delays caused by the implementation of the structural solution, have been shown to be closely linked to individuals' support of structural change (e.g., Van Vugt, 1997).

Another potentially practical implication stems from the results for social value orientation and CFC. Specifically, their differential impact suggests that, in the context of large-scale social dilemmas, appeals to collectively beneficial behavior on the basis of its impact on others' well-being may be ineffective unless decision makers travel down the road of future consequences. Even if they do make this journey, they will still be faced with the problem that their own behavior has a minimal impact on others' outcomes. In such cases, interventions aimed at heightening the perception of being critical (i.e., efficacious; e.g., Chen, 1996; Chen, Au, & Komorita, 1996), coupled with appeals to (long-term) self-interest may be necessary to encourage collectively beneficial behavior. As a caveat, however, we wish to note that a large-scale appeal to self-interest may, concurrently, have deleterious effects; for example, as a result of chronically priming individualism as the basis of choice behavior. Future research will need to determine whether these concerns are justified.

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